



Public Health Preparedness and Response Plan

Pandemic Influenza and Highly Infectious Respiratory Diseases

DRAFT

**Harris County, Texas
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INTRODUCTION

Background

Influenza is a highly contagious viral disease, with epidemics of influenza affecting hundreds of thousands of people nearly every year. The ability for influenza viruses to “drift,” or frequently make slight structural changes over time, results in the appearance of the different strains that circulate among the human population. Vaccines are developed to match the strains expected to circulate each year.

In contrast to the gradual drift process, the influenza virus can also change suddenly and dramatically, through “shift.” Shift results in a new, or “novel” influenza virus to which very few people, if any, are immune. The potential for a pandemic exists if the novel virus has the ability to spread easily from person to person and can cause serious illness. It is important to note, however, that the influenza virus does not need to be novel to cause large-scale epidemics.

The World Health Organization (WHO) has defined phases of a pandemic to assist with planning and response activities:

WHO Pandemic Phase	Overarching Public Health Goals
Inter-Pandemic Period Phase 1: No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in humans, the risk of human infection or disease is considered low Phase 2: No new influenza virus subtypes have been detected in humans. However a circulating animal influenza virus subtype poses a substantial risk of human disease	Strengthen influenza pandemic preparedness at the global, regional, national and subnational levels Minimize the risk of transmission to humans; detect and report such transmission rapidly if it occurs
Pandemic Alert Period Phase 3: Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact. Phase 4: Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans. Phase 5: Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk)	Ensure rapid characterization of the new virus subtype, notification and response to additional cases Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures
Pandemic Period Phase 6: Pandemic – increased and sustained transmission in the general population	Minimize the impact of the pandemic

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The Centers for Disease Control and Prevention (CDC) estimates that in the United States alone up to 200 million people would be infected if a pandemic were to occur, 50 million people would require outpatient care, two million people would be hospitalized and between 100,000 and 500,000 persons would die.

Harris County Public Health and Environmental Services (HCPHES) estimates¹ that the impact of an influenza pandemic on the 1.5 million residents of Harris County (outside the City of Houston) would include:

199,796 outpatient visits (estimated range: 119,877 to 279,715)

3,677 persons hospitalized (estimated range: 2,206 to 5,149)

733 deaths (estimated range: 439 to 1,025)

These estimates underscore the need for planning to lessen the impact of a pandemic.

The impact of a pandemic is not measured only by how many people will die. If millions of people across the country get sick at the same time, major social consequences will occur. If many doctors and nurses become ill, it will be difficult to care for the sick. If the majority of a local police force is infected, the safety of the community might be at risk. If air traffic controllers are all sick at once, air travel could grind to a halt, interrupting not only business and personal travel but also the transport of life-saving vaccines or antiviral drugs. Therefore a vital part of pandemic planning is the development of strategies to address such potential problems.

Purpose

The purpose of the *Response Plan for Pandemic Influenza and Highly Infectious Respiratory Diseases* is to provide a guide for HCPHES on how to respond before, during and after a pandemic situation. The HCPHES Response Plan follows U.S. National Vaccine Program Office (NVPO) guidance for developing pandemic influenza response plans (<http://www.hhs.gov/nvpo/pandemicplan/annex1.pdf>) and is intended as a companion to the *Texas Department of State Health Services Pandemic Influenza Plan and Resource Document*. The Response Plan details the activities identified as the responsibility of the local health departments within the state plan. It is imperative to interpret the HCPHES Response Plan in the context of the state plan.

It is important to note that while the plan focuses on influenza, it is also intended to serve as the template for responding to large-scale outbreaks of other highly infectious respiratory diseases such as Severe Acute Respiratory Syndrome (SARS).

The Response Plan should be read and understood prior to a pandemic situation. It is a dynamic document that will be updated to reflect new developments in the understanding of the disease agent, its spread, treatment and prevention. The plan will also incorporate changes in response roles and improvements in response capability developed through ongoing planning efforts.

¹These estimates are based on (1) population data provided by the HCPHES Epidemiology Section, and (2) rates for hospitalizations, outpatient visits and deaths from Meltzer MI, Kohnanski M, Crosby, R. 1999. FluAid 2.0: Software and manual to aid state and local-level public health officials plan, prepare and practice for the next influenza pandemic. Centers for Disease Control and Prevention, US Department of Health and Human Services. Attack rates of 15%, 25% and 35% suggested by Meltzer, et al.

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The Harris County Office of Homeland Security and Emergency Management (OHS&EM) is responsible for the Harris County Basic Plan, an “all-hazards” disaster plan that encompasses all County agencies. Within this plan, Annex H includes the responsibilities of HCPHES during a disaster affecting the public’s health. The Response Plan presented here is integrated as an appendix to Annex H, along with plans for mass vaccination activities and local administration of the Strategic National Stockpile. As such, the elements of this plan are based on the existing emergency response structure, authorities and responsibilities identified in the Harris County Basic Plan and Annex H.

ASSUMPTIONS

There may be a three month warning period of a coming pandemic.

The period of a pandemic influenza outbreak in a community will likely last from six to eight weeks. There may be more than one wave in a given community.

The health impact of a pandemic event will be great:

- Up to 25-30% of persons may become ill in a major pandemic influenza wave
- Rates of influenza-related hospitalizations and deaths may vary substantially. Estimates based on past pandemic influenza events indicate that 0.01-8% of the population may be hospitalized and 0.001-1% of the population may die.
- The duration of illness for an uncomplicated case of influenza is five days.
- Medical care services will likely be severely taxed or overwhelmed.
- 10% or more of the workforce may be out of work due to illness at the peak of a major pandemic influenza wave. This estimate includes work loss while caring for oneself or for ill family members.

Issues surrounding prophylaxis and treatment are complex:

- The time from a candidate vaccine strain to the production of the first vaccine dosage could be six months or more.
- Once vaccine is available, it may take five months to produce an adequate supply of vaccine for the entire U.S. population (currently production capacity is approximately five million doses per week).
- Two doses of vaccine administered 30 days apart may be required to develop immunity to a novel virus.
- The federal government will purchase all influenza vaccine during a pandemic.
- A six to eight week course of antivirals is recommended for prophylaxis; a five day course is recommended for treatment.
- There is a limited supply of antiviral medications. Antiviral distribution to states will occur through the Strategic National Stockpile.

Local governments have the primary responsibility to provide public health, mental health and emergency medical services within their jurisdictions. State government will augment public health, mental health and emergency medical services that exceed the capabilities of the local government. The Federal Response Plan will support public health and medical activities as required by the State of Texas in accordance with pre-established activation procedures.

Plans for responding to pandemic influenza are based on existing command and control templates developed at the local, state and regional levels, and integrate with existing emergency plans, activities and inventories.

FEDERAL AND STATE ROLES

The following is an excerpt from the NVPO *National Influenza Preparedness and Response Plan*, Annex 1, *State and Local Health Departments Guidance*, August 2004

Federal Roles

The federal government is responsible for nationwide coordination of the pandemic influenza response. Specific areas of responsibility include the following:

- Surveillance in the U.S. and globally
- Epidemiological investigation in the U.S. and globally
- Development and use of diagnostic laboratory tests and reagents
- Development of reference strains and reagents for vaccines
- Vaccine evaluation and licensure
- Determination of populations at highest risk and strategies for vaccination and antiviral use
- Assessment of measures to decrease transmission (such as travel restrictions, isolation and quarantine)
- Deployment of federally purchased vaccine
- Deployment of antiviral agents in the Strategic National Stockpile
- Evaluation of the efficacy of response measures
- Evaluation of vaccine safety
- Deployment of the Commissioned Corps Readiness Force and Epidemic Intelligence Service Officers
- Medical and public health communications

State Roles

States will be individually responsible for coordination of the pandemic influenza response within and between their jurisdictions. Specific areas of responsibility include the following:

- Identification of public and private sector partners needed for effective planning and response
- Development of key components of pandemic influenza preparedness plan: surveillance, distribution of vaccine and antivirals and communications
- Integration of pandemic influenza planning with other planning activities conducted under CDC and the Health Resources and Services Administration's (HRSA) bioterrorism preparedness cooperative agreements with states
- Coordination with local areas to ensure development of local plans as called for by the state plan and provide resources, such as templates to assist in the planning process
- Development of data management systems needed to implement components of the plan
- Assistance to local areas in exercising plans
- Coordination with adjoining jurisdictions

THE PLAN

I. Command and Control

Existing departmental command systems should be applied to pandemic influenza planning and response. These structures should delineate operational priorities and identify who is responsible for making decisions related to the public health response to a pandemic, for carrying out response activities before, during and after a pandemic and for preparing and maintaining the pandemic response plan.

A. Interpandemic Period

1. HCPHES will take the lead in planning the public health response to pandemic influenza for Harris County (outside the City of Houston). HCPHES will coordinate with the Houston Department of Health and Human Services (HDHHS), Harris County Hospital District and the Mental Health and Mental Retardation Authority of Harris County to ensure that planning and response activities are coordinated within Harris County.
2. The Epidemiology Section within the HCPHES Community Health Services Division (CHS) will coordinate surveillance and epidemiological investigation activities, including implementing ongoing influenza surveillance, planning for pandemic epidemiological investigation and coordinating specimen testing with the HDHHS laboratory, the Baylor Influenza Research Center laboratory, the Texas Children's Hospital Diagnostic Virology Laboratory and the TDSHS Bureau of Laboratories
3. The Epidemiology Section will define and quantify local priority population groups to receive vaccine or antiviral medications in case of a vaccine shortage during a pandemic
4. The HCPHES Immunization Program Coordinator within CHS will coordinate planning for the procurement of vaccines, antivirals and supplies
5. The Immunization Program Coordinator, along with the HCPHES Office of Public Health Preparedness (OPHP), will coordinate planning for the distribution of vaccines, antivirals and supplies
6. The Epidemiology Section will maintain information about the capacity of hospitals and treatment centers through the Houston Metropolitan Medical Response System (HMMRS). OPHP will maintain information about the capacity of essential services personnel within the County
7. OPHP will maintain contact with the Harris County Medical Examiner's Office regarding plans to address mass mortality events
8. The HCPHES Veterinary Public Health Division will coordinate activities related to planning for the public health response to an identification of avian influenza in the animal population
9. The HCPHES Office of Public Information (OPI) will coordinate the planning of communications activities for a pandemic response
10. The HCPHES Office of Policy and Planning (OPP) will review and update the Response Plan on an ongoing basis
11. HCPHES will work with community partners to enhance community capacity for responding to pandemic flu

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12. The HCPHES Executive Director will provide the Plan to key policymakers and other stakeholders

B. Pandemic Alert Period

1. The Executive Director will initiate communication with local, state and national counterparts, including OHS&EM, HDHHS, TDSHS and CDC
2. The Epidemiology Section will monitor the Health Alert Network (HAN) and other channels of information and will provide ongoing assessments of the situation to the Executive Director and other relevant HCPHES personnel
3. The Epidemiology Section will increase local surveillance activities and, if applicable, initiate case tracking activities
4. The Epidemiology Section will alert the health community through HAN-Houston, providing an advisory to area hospitals and health care providers to inquire about recent travel to affected areas among patients presenting with severe respiratory illness and to consider implementing severe respiratory illness precautions
5. The Epidemiology Section will coordinate with area hospitals to ensure samples are directed to the correct laboratory for testing
6. OPHP and the HCPHES Materials Management Section will confirm availability of resources to support a pandemic response
7. OPHP will notify the Harris County Department of Education to inform them about the possibility of utilizing County schools as mass vaccination sites, in accordance with memoranda of understanding currently in place
8. OPI will develop and disseminate appropriate information to the public

C. Pandemic Period

1. The Executive Director will activate an incident command structure to:
 - Continue surveillance and tracking activities
 - Determine the need for and scope of mass vaccination activities
 - Coordinate delivery of vaccine and/or antivirals with TDSHS
 - Carry out mass vaccination activities in accordance with the HCPHES *Mass Vaccination Plan*
 - Assess the capacity of area hospitals and identify their resource needs
 - Develop and disseminate appropriate information to the public
 - Ensure ongoing communication with local, state and federal authorities
2. The Executive Director, as Public Health Authority, will consider implementing quarantine and isolation measures for residents of Harris County as appropriate

D. Post-Pandemic

1. The Executive Director will convene relevant parties to debrief from response activities
2. The Executive Director will communicate the status of the response to appropriate local, state and federal authorities
3. OPP will review and update the Response Plan based on lessons learned from response activities

II. Surveillance

There are four primary national surveillance components:

- Virologic surveillance – Each week, approximately 75 U.S. collaborating laboratories that are part of the WHO Influenza Surveillance Network and 50 National Respiratory and Enteric Virus Surveillance System laboratories report the number of clinical specimens tested for influenza and the number of positive results by virus type and subtype.
- Surveillance for influenza-like illness (ILI) – Approximately 1000 sentinel health care providers/clinics located in 50 states regularly report the number of patient visits for ILI by age group and the total number of patient visits each week.
- Surveillance for influenza and pneumonia deaths – The Vital Statistics Offices of 122 U.S. cities report each week the percentage of total deaths that may be influenza-related
- State and territorial epidemiologists assess influenza activity levels in their respective states each week and report it as “widespread,” “regional,” “local,” “sporadic” or “no activity.”
- Information regarding these national surveillance components is updated weekly and can be accessed at www.cdc.gov/ncidod/diseases/flu/weeklychoice.htm.

At the state level, TDSHS collaborates with partners to conduct the following surveillance activities:

- Passive surveillance of respiratory specimens to the TDSHS Public Health Laboratory for viral isolation, identification of influenza type and subtype
- Passive surveillance of ILI outbreaks in long-term care facilities
- Passive surveillance of ILI outbreaks in schools or other institutional settings
- Each week, a voluntary state network of sentinel physicians report the number of patients presenting with ILI and the total number of patient visits by age group each week. As of June 2005 there were approximately 70 participating sentinel physicians reporting throughout the year with at least one site in each region of Texas
- Passive reporting of prescription trends by pharmacists

In addition to these federal and state surveillance activities, HCPHES will establish and coordinate the following local surveillance activities:

A. Interpandemic Period

1. HCPHES will establish and coordinate the CDC sentinel surveillance system within Harris County. HCPHES will recruit a minimum of two physicians for each of the five epidemiological zones, which would provide a sentinel network of one physician for every 150,000 population. HCPHES will recruit representation from each of the following disciplines – internal medicine, family practice, infectious disease, emergency medicine, urgent care, pediatric, obstetrics/gynecology and student health.
2. HCPHES will collaborate with hospital laboratories to establish a system whereby counts of positive rapid influenza test kits and influenza viral cultures are provided to HCPHES on a weekly basis during the months of September through May
3. HCPHES will collaborate with area hospitals to establish a system whereby counts of emergency room visits and deaths due to acute febrile respiratory illness (International

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Statistical Classification of Diseases, 10th Revision, codes 460-487) are provided to HCPHES on an ongoing basis

4. HCPHES will collaborate with area Independent School Districts to develop a system whereby counts of reports of ILI occurrences are provided to HCPHES on a regular basis
5. HCPHES will collaborate with area long-term care facilities to establish a system whereby counts of reports of ILI occurrences are provided to HCPHES on a regular basis
6. HCPHES will establish a system for monitoring over-the-counter (OTC) drug sale information through the Retail OTC Drug Sales system (RODS). This system will allow HCPHES to monitor sales of cough and fever suppressants by zip code. At this time 70%-90% of all major pharmaceutical sales chains participate in the RODS system
7. HCPHES will establish and maintain linkages with the Texas Animal Health Commission to stay informed about suspect clinical symptoms identified and investigated through their passive surveillance in local avian populations, including poultry wholesalers. See Appendix C for background on the role of TAHC in the identification and control of avian influenza.
8. HCPHES will establish linkages with local poultry wholesalers, live bird markets and, when possible, owners of backyard flocks. HCPHES will conduct inspections of wholesalers and live bird markets in response to citizen complaints regarding unsanitary conditions or violations of state regulations, reporting any suspect clinical signs in the bird population to TAHC and TDSHS. In addition, on an ongoing basis HCPHES will provide education and literature to proprietors of poultry wholesalers, live bird markets and backyard flocks regarding appropriate biosecurity practices, clinical signs and symptoms of avian influenza and how and when to contact TAHC and/or HCPHES. This literature will also be made available at local feed stores.

B. Pandemic Alert Period

1. HCPHES will ensure that all interpandemic influenza surveillance activities are underway regardless of the time of year, enhancing activities as needed based on information from HAN alerts, Epi-X alerts, communication from state and federal partners and other sources and investigating the epidemiology of early cases through case tracking activities
2. HCPHES will monitor the HAN, CDC's Epi-X and other appropriate sources for updates regarding international, federal and state surveillance activities
3. HCPHES will monitor and institute recommendations from CDC for any additional surveillance activities that should be undertaken given the specific circumstances
4. HCPHES will inform state and federal partners about increased local surveillance activities. If necessary, HCPHES will request additional resources for local surveillance and case tracking activities (e.g. CDC Epidemiological Intelligence Officers, reagents to detect and identify the novel strain, instructions for safe handling and testing of a potential novel influenza virus)
5. If necessary, HCPHES will utilize HAN-Houston to notify area hospitals, physicians, emergency rooms and urgent care centers, requesting that they increase laboratory diagnosis of influenza for persons presenting with ILI, especially those with recent travel history to regions where the pandemic strain of influenza is circulating or those with

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unusual or severe symptoms. HCPHES will provide instructions for the safe handling of a potential novel influenza virus

6. HCPHES will coordinate the collection of ILI specimens among area providers and laboratories and facilitate the transfer of ILI specimens to TDSHS and/or CDC
 - HCPHES will coordinate with area hospitals, physicians, emergency rooms and urgent care centers to provide instructions for directing samples from patients presenting with severe or unusual ILI to the appropriate laboratory for testing. HCPHES will provide instructions for the safe handling of a potential novel influenza virus
 - HCPHES will communicate with laboratory staff regarding the testing and reporting of ILI specimens. HCPHES will provide instructions for the safe handling and testing of a potential novel influenza virus
7. HCPHES will assess the completeness and timeliness of reports from all participating laboratories and sentinel providers. HCPHES will collaborate with these partners to enhance and facilitate complete and timely reporting
8. HCPHES will issue regular alerts regarding surveillance and case tracking activities to the health community through HAN-Houston
9. In coordination with the CDC Quarantine Officer, HCPHES will assess the need to screen travelers arriving in the area from affected countries

C. Pandemic Period

1. HCPHES will enhance ongoing surveillance activities to include the following:
 - Monitoring health impacts, including deaths and hospitalizations
 - Monitoring community impacts, including absenteeism in schools and essential services
 - Monitoring reports of antiviral resistance
 - Monitoring reports of vaccine effectiveness

D. Post-Pandemic Period

2. HCPHES will develop a detailed summary of the pandemic, utilizing surveillance data to evaluate the efficacy of local response activities. Analysis may include:
 - Severity of influenza outbreaks among demographic groups
 - Age-specific attack rate, morbidity and mortality
 - Efficacy of vaccination distribution and implementation of infection control measures
 - Extent of medical, social and economic impact

III. Prevention and Containment

Three methods for preventing influenza and containing its spread include community control measures, antiviral medication and vaccines.

Implementation of Community Level Control Methods

The goal of community level containment measures is to slow the spread of pandemic influenza as much as possible and to provide additional time for the development, manufacture, distribution and administration of influenza vaccine and antiviral medications. Strategies to achieve this goal must take into consideration the modes of transmission of influenza, the short incubation period, the non-specific clinical presentation, the likelihood of asymptomatic infected persons who may be transmitting infection and past experience in the use of containment measures during pandemic influenza.

There are two key strategies for preventing transmission, each with varying degrees of efficacy. The first involves decreasing the probability that contact will result in infection, and may include activities such as providing education to the public about practicing cough etiquette and proper hand and respiratory hygiene. The second involves decreasing contact between infected and uninfected individuals, and may include activities such as isolating suspected cases and quarantining case contacts, issuing travel advisories and canceling schools and large gatherings.

A. Interpandemic Period

1. HCPHES will conduct ongoing education regarding the importance of hand hygiene, cough etiquette and annual influenza vaccination
2. HCPHES will review appropriate legal authorities regarding the implementation of community level control measures, including quarantine laws. HCPHES will maintain templates of documentation needed to enact community level control measures
3. HCPHES will develop and maintain contact information with partners through whom HCPHES may communicate information about community level control measures, including hospitals, independent school districts, private school associations, parks and recreation departments, the child day care licensing authority, homeowners associations, chambers of commerce, sports organizations, etc.
4. HCPHES will develop plans for communicating information to the public about community level control measures

B. Pandemic Alert Period

Possible containment measures if cases are first detected outside the U.S.

1. HCPHES may recommend isolation of persons who are recent travelers to affected regions if they have ILI. If influenza is suspected or confirmed, HCPHES may recommend isolation at home or in a hospital until isolate subtyping is accomplished. Isolation should continue for at least seven days, until viral shedding is no longer detected or until the isolate is laboratory confirmed not to be a novel influenza A virus
2. HCPHES may recommend quarantine for contacts of cases

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3. HCPHES may issue an advisory recommending limiting travel to the affected region and screening travelers arriving from the affected region for illness compatible with influenza
4. HCPHES will increase education about the importance of hand hygiene, cough etiquette and annual influenza vaccination

Possible containment measures if cases are first detected in the U.S. outside Harris County

1. HCPHES may recommend that persons who are positive for influenza A be placed in isolation at home or in a hospital until isolate subtyping can be accomplished. Isolation should continue for at least seven days, until viral shedding is no longer detected or until the isolate is laboratory confirmed not to be the novel virus
2. HCPHES may recommend quarantine for contacts of cases
3. HCPHES will increase public education regarding the importance of hand hygiene and cough etiquette

Possible containment measures if cases are first detected in Harris County

1. HCPHES may recommend that persons who have ILI be placed in isolation at home or in a hospital until subtyping of their isolate can be accomplished. Isolation should continue for at least seven days, until viral shedding is no longer detected or until the isolate is laboratory confirmed not to be the novel virus
2. HCPHES may recommend quarantine for contacts of cases
3. If an animal source is identified and there is ongoing transmission within the animal population, HCPHES may recommend that persons who may be in contact with potentially infected animals wear appropriate personal protective equipment. Refer to Appendix B for more information about procedures when an animal source is identified
4. HCPHES may recommend that citizens limit travel to destinations outside of Harris County, as well as limit non-essential travel within Harris County
5. HCPHES may recommend cancellation of large gatherings depending on the level of person-to-person transmission. Based on the epidemiology of the known infected cases, HCPHES may consider closure of schools, including colleges and universities, and closure of office buildings
6. HCPHES will increase public education regarding the importance of hand hygiene and cough etiquette

C. Pandemic Period

1. HCPHES may recommend that all persons who are ill and their contacts remain in isolation at home
2. HCPHES may recommend limitation or suspension of large gatherings and recreation activities
3. HCPHES may recommend the closure of schools, including colleges and universities and closure of office buildings
4. HCPHES may recommend the limitation of non-essential work activities, encouraging telecommuting when possible
5. HCPHES may recommend an area quarantine

D. Post-Pandemic Period

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1. HCPHES will suspend all community level control measures
2. HCPHES will assess the compliance with community level control measures and evaluate the efficacy of community level control measures

Use of Antivirals

Antiviral medications may play an important role for the control of influenza, particularly in the period of time in a pandemic event before vaccine becomes widely available. Antiviral medications can be used for both prophylaxis and treatment. Currently, a 6-8 week course of antivirals is recommended for prophylaxis, and a 5-day course of antivirals is recommended for treatment. Because of the limited supply of antivirals, utilizing antivirals for prophylaxis may not be feasible except in very limited circumstances. Therefore planning must be focused on the use of antivirals for treatment of exposed persons rather than on prophylaxis. Further, plans should designate the treatment delivery site for antivirals to be the point of care (e.g. hospitals) rather than a Point of Dispensing (POD) site such that is used in mass prophylaxis planning.

Because it is best suited for treatment, Oseltamivir will likely be the primary antiviral utilized during a pandemic event. Zanamivir will likely be utilized for Oseltamivir-resistant viruses and for pregnant women.

Though in summer 2005 the NVPO has recommended that the federal government stockpile 133 million courses of antiviral, the existing supply and production capacity for antiviral drugs is far less than would be needed to provide treatment for the anticipating number of persons exposed during a pandemic event. Therefore, it is crucial to develop recommendations for prioritizing population groups to receive antivirals for therapy during a pandemic event.

A. Interpandemic Period

1. On an ongoing basis HCPHES will review CDC guidance defining priority populations to receive antivirals for therapy and, where indicated, prophylaxis during a pandemic before antivirals and/or vaccine are widely available to all citizens. In July 2005 CDC adopted the following populations for receipt of antiviral treatment, listed in order of priority:
 - a) Hospitalized patients with influenza
 - b) Healthcare workers with direct patient contact
 - c) Highest-risk outpatients
 - d) Pandemic health responders, public safety and key government decision makers
 - e) Increased-risk outpatients
 - f) Persons involved in outbreak response activities (post-exposure prophylaxis only)
 - g) Healthcare workers working in emergency rooms, intensive care units, emergency medical services and dialysis (prophylaxis)
 - h) Pandemic society responders and other healthcare workers
 - i) Other outpatients

If additional antiviral is available, following CDC guidance HCPHES will prioritize the following groups for antiviral prophylaxis:

- a) Highest-risk outpatients

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- b) Other healthcare workers with patient contact
2. HCPHES will determine and maintain estimates of the number of persons within each priority population, revising the estimates on an annual basis. These estimates are included in Appendix A
3. HCPHES will coordinate among area hospitals to ensure that plans are in place to provide antiviral therapy
4. HCPHES will collaborate with HDHHS and other area jurisdictions to coordinate plans for the provision of antiviral therapy

B. Pandemic Alert Period

1. HCPHES will review and modify its plan for the provision of antivirals as needed to account for updates received regarding the novel virus. Such updates may include recommended target groups and projected antiviral supply
2. HCPHES will notify the medical community of the status of antiviral availability and plans to disseminate it to the established priority groups
3. HCPHES will disseminate antiviral use guidelines to the medical community
4. HCPHES will assess its human resources and logistics capabilities to ensure that appropriate staff and supplies are available to support activities associated with the provision of antiviral therapy at treatment centers, if necessary

C. Pandemic Period

1. HCPHES will communicate with the regional TDSHS office regarding the availability and, if applicable, the delivery of antivirals through the Strategic National Stockpile. HCPHES will provide TDSHS with an estimated number of persons within each priority population as well as the population as a whole.
2. HCPHES will coordinate with TDSHS and area treatment centers to ensure that antivirals are appropriately allocated among treatment centers.
3. HCPHES will collaborate with HDHHS and other area jurisdictions to coordinate efforts to provide antiviral therapy
4. HCPHES will evaluate antiviral delivery and administration procedures and modify plans as necessary

D. Post-Pandemic Period

1. HCPHES will discontinue and demobilize antiviral administration, ensuring that supplies are inventoried and returned as appropriate
2. HCPHES will evaluate antiviral delivery and administration procedures and modify plans as necessary

Use of Vaccine

Vaccine will serve as one preventive strategy during an influenza pandemic. Unlike annual production of influenza vaccine, wherein strains are selected in the spring and vaccine is manufactured and delivered during the summer to be used during the fall and winter influenza season, a pandemic strain could be detected at any time. Because current manufacturing procedures require four to eight months before large amounts of vaccine are available for distribution, there could be a large gap between identification of a pandemic strain and availability of vaccine. Further, once vaccine becomes available, production capacity may allow for just 1-2% of the population being vaccinated per week. Therefore it is necessary to plan for the allocation of vaccine based on priority population groups.

A. Interpandemic Period

1. HCPHES will initiate and/or continue activities to enhance annual influenza vaccination coverage levels in traditional high-risk groups, particularly subgroups in which coverage levels are low. Activities will be carried out prior to the beginning of the traditional influenza season each year and will include:
 - Evaluating and implementing epidemic control strategies, e.g. recommendations from TDSHS, CDC and the Baylor Influenza Research Center
 - Disseminating educational materials to area health care providers, including a summary of the most current influenza vaccine recommendations, suggested strategies for reaching at-risk populations and a list of resources to help promote and deliver influenza vaccine to patients
 - Providing education to area hospital staff about the importance of vaccinating healthcare workers and patients with high-risk medical conditions
 - Providing education to area nursing home and assisted living facility staff about the importance of vaccinating persons over the age of 65
 - Recommending that all healthy schoolchildren over age 5 receive the appropriate influenza vaccine and working with area pediatricians and school nurses to operationalize this recommendation
 - Recommending that all persons responsible for community safety and security receive annual influenza vaccination, including emergency medical personnel, police and firefighters
 - Utilizing traditional and non-traditional communications channels to educate the general public about the importance of annual influenza vaccination
 - Maintaining current information about influenza and influenza vaccination on the HCPHES website. Information will be targeted to the healthcare community and to the general public
 - Educating corporate partners about the importance of a vaccinated workforce
 - Advocating to state and federal partners the development of a standardized method to track and report vaccine shipments from private companies to local entities in order to quickly assess distribution during a vaccine shortage
2. HCPHES will initiate and/or continue activities to enhance pneumococcal vaccination coverage levels in traditional high-risk groups to reduce the incidence and severity of

secondary bacterial pneumonia. Such activities will occur in concert with the activities described in the bullets above

3. On an ongoing basis HCPHES will review CDC guidance defining priority populations to receive vaccine for prophylaxis during a pandemic before vaccine is widely available to all citizens. In July 2005 CDC adopted the following populations for receipt of vaccine, listed in order of priority:
 - 1a) Healthcare workers involved in direct patient contact, critical healthcare support staff and vaccine and antivirals manufacturing personnel. Applicable healthcare workers include those in the following settings: inpatient, outpatient, home care, EMS, blood collection, supporting laboratories, vaccinators and public health providers with direct patient contact plus their critical support personnel.
 - 1b) Highest risk group, including persons >64 years with 1+ high-risk condition, persons 6 months-64 years with 2+ high-risk conditions and persons who have been hospitalized in the prior year with pneumonia, influenza or an ACIP high-risk condition.
 - 1c) Household contacts of children aged <6 months, severely immunocompromised persons and pregnant women
 - 1d) Key government leaders and critical pandemic public health responders
 - 2a) Other high-risk persons, including persons ≥65 years with no high-risk conditions, persons 6 months-64 years with 1 high-risk condition and persons 6-23 months
 - 2b) Critical infrastructure personnel, including public health emergency responders not including in 1A; public safety personnel (fire, police, 911 dispatchers, correctional facility staff); utility workers essential for maintaining power, water and sewage systems; transportation workers critical for transporting fuel, food, water and medical supplies and for public ground transportation; and telecommunications/IT personnel essential for maintaining functional communication and network operations
 - 3) Other key government health care decision makers not included in 1D and mortuary services
 - 4) Healthy persons aged 2-64 not included in the above categories
4. HCPHES will determine and maintain estimates of the number of persons within each priority population, revising the estimates on an annual basis. These estimates are included in Appendix B
5. HCPHES will review and update the methodology within its *Mass Vaccination Plan* for providing vaccination during a pandemic in the event of a severe or moderately severe vaccine shortage
6. HCPHES will review and update its *Mass Vaccination Plan* to ensure that it addresses issues relevant to the provision of influenza vaccine. This plan includes information relevant to providing vaccination to the general public once vaccine becomes widely available, including:
 - Sites to use as mass vaccination clinics
 - Staffing needs and duties
 - Protocols for proper storage of vaccine
 - Protocols for vaccine clinic operations
 - Supplies needed for vaccine clinic operations
 - Model clinic flow design

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7. HCPHES will identify and maintain information about local sources of supplies needed for administering vaccine
8. HCPHES will ensure that appropriate legal authorities are in place that will allow for the implementation of measures relevant to mass vaccination activities during a pandemic
9. HCPHES will collaborate with HDHHS and other area jurisdictions to coordinate plans for mass vaccination efforts

B. Pandemic Alert Period

1. HCPHES will review and modify its *Mass Vaccination Plan* as needed to account for updates received regarding the novel virus. Such updates may include recommended target groups and projected vaccine supply
2. HCPHES will assess its human resources and logistics capabilities to ensure that appropriate staff and supplies are available to begin vaccination activities, if necessary

C. Pandemic Period

1. HCPHES will communicate with the regional TDSHS office regarding the availability and delivery of vaccine. HCPHES will provide TDSHS with an estimated number of persons within each priority population
2. Prior to widespread vaccine availability, HCPHES will provide vaccine as it is available to priority groups based on the methodology described the *Mass Vaccination Plan*
3. Upon widespread vaccine availability, HCPHES will fully activate mass vaccination activities according to the *Mass Vaccination Plan*
4. HCPHES will collaborate with HDHHS and other area jurisdictions to coordinate mass vaccination efforts
5. HCPHES will track and monitor adverse vaccine reactions. HCPHES will provide persons receiving vaccine with information about reporting such reactions to the Department. HCPHES will then report any reactions to the CDC Vaccine Adverse Event Reporting System (VAERS)
6. vaccination activities, ensuring that supplies are inventoried and returned as appropriate
7. HCPHES will evaluate vaccine delivery and administration procedures and modify plans as necessary

D. Post-Pandemic

1. Following the *Mass Vaccination Plan*, HCPHES will discontinue and demobilize mass vaccination activities, ensuring that supplies are inventoried and returned as appropriate
2. HCPHES will evaluate vaccine delivery and administration procedures and modify plans as necessary

VI. Emergency Response: Health Systems and Critical Infrastructure

While Harris County's disaster plan addresses all hazards, pandemic influenza differs from many threats due to the magnitude and duration of its impact and the likelihood of subsequent waves of disease. Of great concern during a pandemic event is its effect on the capacities of the healthcare system and other critical community services.

A. Interpandemic Period

1. HCPHES will work with area hospitals to ensure that policies, plans and protocols for pandemic influenza are developed and maintained. Key policies will include those regarding reporting to HCPHES and those regarding infection control procedures.
2. HCPHES will collaborate with such partners as OHS&EM and the HMMRS to develop and maintain an inventory of the following resources:
 - Hospital and long-term care bed capacity
 - Intensive care unit capacity
 - Ventilators
 - Personal protective equipment
 - Specimen collection and transport materials
 - Sources of consumable medical supplies
 - Medical personnel who may be utilized during an emergency situation
 - Pharmacies and pharmacists
 - Contingency medical facilities
 - Mortuary/funeral services
 - Social services/mental health services/faith services
3. In collaboration with OHS&EM, HCPHES will develop and maintain a list of personnel whose absence would pose a serious threat to public safety or would significantly interfere with pandemic response activities
4. Using inputs from A.1 and A.2, HCPHES will estimate the impact of pandemic influenza on healthcare services and critical infrastructure within Harris County. HCPHES will utilize the CDC FluAid program to derive these estimates

B. Pandemic Alert Period

1. Through HAN-Houston, HCPHES will regularly provide updated information about the epidemiology and spread of the novel virus to the local healthcare community, including emergency medical providers and hospitals
2. Through HAN-Houston, HCPHES will recommend that emergency medical providers and hospitals activate severe respiratory illness protocols and provide guidance about the appropriate use of personal protective equipment
3. HCPHES will establish regular communication with OHS&EM, providing updated information about the epidemiology of the novel virus

C. Pandemic Period

1. In accordance with Harris County Basic Plan, Annex H, OHS&EM will activate a local Emergency Operations Center (EOC) to manage the needs of health, medical and essential service agencies during the pandemic. HCPHES will designate a liaison to the EOC to communicate timely and accurate information about the epidemiology of the pandemic
2. HCPHES will continually review information about the epidemiology of the pandemic. Based on this data HCPHES will develop and provide the EOC with protective action recommendations for the health, medical and essential services sectors

D. Post-Pandemic Period

1. HCPHES will participate in recovery and demobilization efforts in coordination with the EOC
2. HCPHES will provide OHS&EM with an assessment of the impact, response and control of the public health response during the pandemic

VII. Communicating with the Public

Communicating information to the public about pandemic influenza will be carried out according to policies and procedures described in the HCPHES *Crisis and Emergency Risk Communication Plan*. This document details the means, organization and process by which HCPHES will provide information and instructions to the public before, during and after a public health threat or emergency such as pandemic influenza.

The unique nature of a pandemic requires crisis and risk communications planning. Guided by its *Communication Plan*, HCPHES will develop messages to ensure that the public receives timely and accurate information about the following during a pandemic event:

- Basic information about influenza, high-risk populations and recommended preventive practices
- The epidemiology of the pandemic
- The symptoms that should prompt seeking medical assistance
- The availability of vaccines and antivirals and the rationale for providing medication to priority groups during vaccine and antiviral shortages
- Instructions for receiving vaccine and antivirals at mass vaccination sites
- Directives for community level containment activities
- Explanations of concepts such as isolation and quarantine

The *Crisis and Emergency Risk Communication Plan* is maintained by the HCPHES OPI.

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APPENDIX A: ESTIMATES OF PRIORITY POPULATIONS FOR ANTIVIRALS

The following table includes estimates of the number of persons in each priority population within Harris County (including the City of Houston) as of August 2005.

	Group	Treatment or Prophylaxis	Estimate
A	Hospitalized patients with influenza	Treatment	
B	Healthcare workers with direct patient contact; emergency medical services personnel	Treatment	
C	Highest-risk outpatients	Treatment	
D	Pandemic health responders, public safety personnel and key government decision makers	Treatment	
E	Increased-risk outpatients	Treatment	
F	Outbreak response personnel	Post-exposure prophylaxis	
G	Healthcare personnel working in emergency rooms, intensive care units, emergency medical services and dialysis	Prophylaxis	
H	Pandemic society responders and other healthcare workers	Treatment	
I	Other outpatients	Treatment	
J	Highest-risk outpatients	Prophylaxis	
K	Other healthcare workers with patient contact	Prophylaxis	

APPENDIX B: ESTIMATES OF PRIORITY POPULATIONS FOR VACCINATION

The following table includes estimates of the number of persons in each priority population within Harris County (including the City of Houston) as of August 2005.

	Group	Estimate	Cumulative
1A	Healthcare workers with direct patient contact plus essential healthcare support staff		
1B	Persons in the highest-risk groups		
	Persons >64 years with 1+ high-risk conditions		
	Persons 6 months-64 years with 2+ high-risk conditions		
	Persons with a hospitalization in prior years with pneumonia or influenza or an ACIP high-risk condition		
1C	Household contacts of children less than 6 months and persons who are severely immunocompromised; pregnant women		
1D	Key government leaders and critical public health pandemic responders		
2A	Persons in the remaining high risk groups		
	Persons ≥ 65 years with no high-risk conditions		
	Persons 6 months-64 years with 1 high-risk condition		
	Persons 6-23 months		
2B	Persons in critical infrastructure groups		
	Other public health emergency responders		
	Public safety personnel (fire, police, 911 dispatchers, correctional facility staff)		
	Utility workers essential for maintaining power, water and sewage systems		
	Transportation workers critical for transporting fuel, food, water and medical supplies and for public ground transportation		
	Telecommunications/IT personnel essential for maintaining functional communication and network operations		
3	Other key government health decision makers and mortuary services		
4	Healthy persons aged 2-64 years not included in above categories		

APPENDIX C: CONSIDERATIONS FOR AVIAN INFLUENZA

Background

Avian influenza viruses are endemic worldwide and are frequently associated with disease in domestic poultry. Not all strains cause disease and the ones that do can vary from low to high pathogenicity. The virus frequently mutates and can change from a low to a high pathogenic strain as well as develop the ability to infect mammals, such as pigs and humans.

Since the virus is usually found in fowl, the Texas Animal Health Commission (TAHC) and United States Department of Agriculture (USDA) are responsible for surveillance and control in the state of Texas. Depending on the size of the response necessary and the pathogenicity of the virus strain, local and state governments may not have enough resources to handle all of the operations and activities involved in control of the disease. Therefore, the command structure will involve multiple jurisdictions and agencies.

There are many things to consider when working with avian influenza. The virus may be extremely difficult to isolate and control, especially if it moves into wild birds or mammals. Once the virus is identified, a “hot zone” will be identified by TAHC/USDA and all of the domestic fowl in this area will have to be identified, depopulated and disposed of properly. There will be a considerable amount of emotional stress for owners, responders and communities and all of the owners will expect reimbursement for the animals.

A more thorough discussion of the state’s response is contained in the TAHC *Foreign and Emerging Animal Diseases Response Plan*, Appendix 3 to Annex O. However, at this time the priorities in this Plan are centered on stopping the spread of the disease in animals and the economic implications, not the human health risks and the possibility for virus mutation.

The lead agencies for responding to an avian influenza event will be TAHC and USDA. The TAHC Plan assigns responsibility for human health and investigating the zoonotic potential of the virus to TDSHS.

HCPHES Response to the Identification of Avian Influenza in the Animal Population

If avian influenza were identified among the animal population within Harris County, HCPHES will undertake the following activities:

- The HCPHES Veterinary Public Health Division may be asked to work with TAHC to identify and collect fowl populations in the hot zone
- The Epidemiology Section will work closely with TDSHS to monitor persons who have had contact with the infected birds for any sign of respiratory illness
- The HCPHES Zoonosis Veterinarian will prepare information for distribution to area veterinarians describing the outbreak, discussing the clinical signs and encouraging local practitioners to report any suspect cases

APPENDIX D: HEALTH CARE SYSTEM GUIDANCE

The following is excerpted from the U.S. Department of Health and Human Services' *National Influenza Preparedness and Response Plan*, Annex 2, *Health Care System Guidance*, August 2004

An influenza pandemic will create significant challenges for the health care system. The number of children and adults seeking care for febrile and respiratory illnesses will increase substantially; some disease will be severe, requiring inpatient care; and many of those infected will have underlying risk factors for adverse outcome, including death. Influenza also will occur among health care workers and their family members, resulting in shortages of trained staff to care for others. Physical resources, such as hospital beds and respiratory therapy equipment, may not be sufficient to meet demand. Shortages of antiviral medications and vaccine will limit the ability to implement these preventive interventions.

Although these stresses on the health care system are inevitable in an influenza pandemic, coordination, planning and exercising preparedness plans can improve the effectiveness of a pandemic response and limit mortality and morbidity.

HCPHES will work with hospitals, treatment centers and long-term care facilities to share information about preparing for and responding to pandemic influenza. Central to this will be the *Health Care System Guidance*.

The goal of the *Health Care System Guidance* is to assist medical provider organizations, health care systems, hospitals, long-term care facilities, home health agencies and other groups that provide health care services plan for and respond to pandemic influenza. This Guidance, which can be accessed at <http://www.hhs.gov/nvpo/pandemicplan/annex2.pdf>, contains information to aid in the development of a comprehensive pandemic influenza preparedness and response plan. The Guidance provides recommendations for developing a plan with the following components:

- I. Preparedness and Response Activities
 - A. Decision-Making and Coordination
 - B. Surveillance and Triage
 - C. Triage and Clinical Evaluation of Patients
 - D. Human and Physician Resources for Inpatient Care
 - Staffing
 - Bed Availability
 - Equipment and Supplies
 - E. Education, Training and Communications
- II. Health Care Systems, Antiviral Drugs and Influenza Vaccine
- III. Infection Control
 - A. Background
 - B. General Principles of Routine Infection Control

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- C. Standard Precautions
- D. Respiratory Hygiene/Cough Etiquette
- E. Droplet Precautions
- F. Other Components of Infection Control for Influenza Pandemic
 - Staff Education
 - Bed Management
 - Patient Transport
 - Cleaning, Disinfection and Sterilization
 - Patient Education
 - Visitors
 - Health Care Workers with Influenza-Like Illness
 - Elective Utilization of Health Care Facilities
 - Home Health Care
- IV. Outbreak Control
- V. Medical Care at Non-Traditional Facilities

APPENDIX E: CONTACT INFORMATION

Contact to HCPHES is available 24 hours a day, 7 days a week by calling 713-439-6000 during office hours (8:00 am-5:00 pm, Monday through Friday) or 713-755-5000 after hours. Key contacts for pandemic influenza activities include:

Herminia Palacio, M.D., M.P.H., Executive Director, 713-439-6000,
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Umair Shah, M.D., M.P.H., Deputy Director, 713-439-6002, ushah@harriscountyhealth.com

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Rita Obey, Chief, Office of Public Information, 713-439-6293, robey@harriscountyhealth.com

APPENDIX F: ACRONYMS

CDC	Centers for Disease Control and Prevention
CHS	Community Health Services Division
EOC	Emergency Operations Center
HAN	Health Alert Network
HAN-Houston	Houston Area Health Alert Network
HCPHES	Harris County Public Health and Environmental Services
HDHHS	City of Houston Department of Health and Human Services
HMMRS	Houston Metropolitan Medical Response System
ILI	Influenza-Like Illness
NVPO	National Vaccine Program Office
OHS&EM	Harris County Office of Homeland Security and Emergency Management
OPHP	Office of Public Health Preparedness
OPI	Office of Public Information
OPP	Office of Policy and Planning
RODS	Retail Over-the-Counter Drug Sales System
TAHC	Texas Animal Health System
TDSHS	Texas Department of State Health Services
SARS	Severe Acute Respiratory Syndrome
USDA	United States Department of Agriculture
VAERS	Vaccine Adverse Event Reporting System
VFC	Vaccines for Children Program
WHO	World Health Organization